New claim 22 is added as follows:

22. (New) The connector arrangement of claim 17, wherein the plurality of pairs of conductors are disposed on one side of the circuit board.

Remarks

Applicant has reviewed and considered the Office Action dated December 26, 2000. In response thereto, claim 18 is amended to address an informality matter; and new claim 22 is added. As a result, claims 15-22 are pending in the present application.

Claim 18 is amended to correct a preamble inconsistency.

Claims 15-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Rhee. Applicant respectfully traverses the rejection for the following reasons.

Claim 15 recites a method of compensating cross-talk in a connector arrangement which comprises the steps of forward compensating unbalanced capacitance in the plug, and reverse compensating unbalanced capacitance and inductance caused by the forward compensation.

Rhee discloses an apparatus for inhibiting cross talk under a difference mode. In particular, Rhee discloses four pairs of lines disposed on the front and rear faces of a printed circuit board (PCB) with a spiral capacitor or auxiliary capacitor between two particular communication lines. Accordingly, Rhee discloses a method of compensating unbalanced capacitance between the lines, i.e., the forward compensation. However, Rhee does not disclose or teach a method of reverse compensation for compensating unbalanced capacitance and inductance caused or induced by the forward compensation. Thus, claim 15 is not anticipated by Rhee.

Further, nowhere in Rhee does it suggest or teach a method of reverse compensation for compensating unbalanced capacitance and inductance caused by the forward compensation. In Rhee, it discloses an apparatus which inserts an auxiliary capacitor between the first line and the third line (column 2, lines 56-57); inserts an auxiliary capacitor between the third line and the fifth line (column 2, lines 60-62); prior to considering the sixth line relative to the pair 4&5, inserts an auxiliary capacitor between the fourth line and the sixth line rather than the fifth line like in all the other pairs (column 3, lines 1-4); and inserts an auxiliary capacitor between the sixth line and the eighth line. None of these auxiliary capacitors are inserted to compensate unbalanced capacitance and inductance caused or induced by a forward compensation.

Furthermore, Rhee does not appreciate the problems addressed by the present invention (page 2, lines 17-26 of the present application), e.g., it has been found that capacitive compensation only worsens the directivity or equal-level of the far-end crosstalk (FEXT) of the connector because the capacitor formed by two conductive lines has an inductive effect which is not accountable for; also, it has been found that the additional compensation has a reverse capacitive effect on the near-end crosstalk (NEXT) of the connector. Rhee may have realized a capacitive unbalance problem at the near end (column 3 lines 35-37), but Rhee does not appreciate the additional capacitive unbalance problems caused by the additional capacitors, for example, the inductive effect at the far end and the reverse capacitive effect at the near end.

Accordingly, Rhee discloses a method of compensation by forming the auxiliary capacitors to balance the unbalanced capacitance. Each of Rhee's auxiliary capacitor is formed from two parallel lines: one line originates from the jack terminal, and the other is from the insulation displacement contact (IDC) terminal. Rhee does not address an apparatus or method of balancing the capacitors that he has introduced. For example, to reduce crosstalk between pin

4,5 and pin 3,6 Rhee builds two capacitors. Each capacitor is formed by two strip lines coming from opposite direction. The third line and the fifth line form one capacitor, and the fourth line and the sixth line form the other. Rhee has no other mechanism to reversibly compensate or balance out these two capacitors.

The present invention on the other hand is clearly distinguished from Rhee's method. The claimed invention addresses the capacitively conventional compensation technique, referred to as the forward compensation, strictly at the jack terminal to suppress the inherent crosstalk occurred in the plug into which the jack is mated, in combination with the compensation technique which reverses or balances the induced forward compensation.

It has been found that the forward compensation alone is not effective enough to suppress the crosstalk, especially at high frequency, e.g. frequency greater than 100 MHz. The forward compensation alone can suppress so much crosstalk before it rapidly starts to have a reverse effect on the near-end crosstalk (NEXT) at high frequency, e.g. frequency greater than 100 MHz. Moreover, over-compensating capacitively without any balanced compensations, i.e. reverse compensations, will worsen the directivity or far-end crosstalk (FEXT) of a connector due to the additional contribution of the inductive crosstalk caused or induced by the conductive lines forming the capacitors.

Therefore, Applicant respectfully submits that claim 15 patentably distinguishes over Rhee.

Claim 17 also recites the features discussed above. Claims 16 and 18-21 are dependent from claims 15 and 17, respectively. Thus, claims 16-21 are also patentable over Rhee.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee in view of Goodrich et al. Goodrich fails to remedy the deficiencies of Rhee. Thus, claims 19 and 20 are patentable over Rhee in view of Goodrich.

New claim 22, which is dependent from claim 17, further recites that the plurality of pairs of conductors are disposed on one side of the PCB. Rhee's conductors are, however, disposed on front and back sides of the PCB.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Reconsideration of the present application and a favorable response are respectfully requested.

If a telephone conference would be helpful in resolving any remaining issues, please contact the below signed at 612-336-4733.

Respectfully submitted,

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Markup version of the amended claim 18

18. (Amended) The [method] connector arrangement of claim 17, wherein the forward-compensating capacitance is formed by using additional parallel conductors on the circuit board, and the reverse-compensating capacitance is formed by using additional parallel conductors on the circuit board.